

STANDARD SPECIFICATIONS
& CONSTRUCTION DETAILS MANUAL

SECTION 2 - GENERAL PROVISIONS

2.01 General

All construction shall conform to the requirements and dimensions on the approved construction plans, Town Standard Details, the Code of the Town of Knightdale, or as stated in these Specifications.

2.02 Abbreviations & Definitions

a. Abbreviations:

AASHTO - American Association of State Highway Transportation Officials

ASTM - American Society for Testing & Materials

AWWA - American Water Works Association

NC DOT - North Carolina Department of Transportation

ANSI - American National Standard Institute

b. Definitions:

Where the word "Engineer" is used in these Specifications, it shall be the Town Engineer of Knightdale, the Town's Consulting Engineer as designated by the Town Manager, or an assistant or other representative duly authorized by the Town Engineer or the Town's Consulting Engineer.

Where the words "Town Representative" are used in these Specifications, it shall be the Director of Public Works & Utilities of the Town of Knightdale or an assistant or other duly authorized representative of the Town of Knightdale, North Carolina.

Where the word "Town" is used in these Specifications, it shall be the Town of Knightdale, North Carolina.

Where the word "Developer" or "Contractor" is used in these Specifications, it shall be the developer of the project or his authorized contractor performing work on the site. For purposes of these Specifications, these words are to be considered synonymous. All Contractors performing construction or installation of public facilities shall be properly licensed for the work by the NC Licensing Board for General Contractors. Prior to commencing work, the Contractor shall submit proof of licensure. The Contractor shall also submit information including mailing and street address for the firm, ownership information, telephone numbers for contact during regular business hours and emergency telephone numbers for contact during nights, weekends and holidays.

Where the words "Project Engineer" are used in these Specifications, they shall mean the design engineer, land surveyor, or landscape architect retained by the developer, and the person responsible for the preparation of the final construction drawings.

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2.03 Insurance Requirements

If work is to be performed within any Town street right-of-way or on Town owned property, the Developer/Contractor shall submit a certificate of insurance to the Town stating that coverage is in effect during the project duration. The limits of coverage shall be no less than \$3,000,000 for general liability (bodily injury and property damage) plus \$2,000,000 for automobile liability (bodily injury and property damage).

2.04 Erosion & Sedimentation Control

a. General Requirements:

Temporary and permanent erosion control measures shall be provided in accordance with the erosion and sedimentation control plan approved by the Erosion, Flood and Stormwater Division of the Wake County Environmental Services Department. The approved Erosion and Sedimentation Control Plan shall be kept on site by the Contractor at all times that work is being performed.

All permanent erosion and sedimentation control measures shall be incorporated into the work at the earliest practicable time, and in no case shall an area remain denuded for more than 30 working days. Temporary erosion and sedimentation control measures shall be coordinated with permanent erosion and sedimentation control measures and all other work on the project to ensure economical, effective and continuous erosion and sedimentation control throughout the construction and post construction period and to minimize siltation of streams, lakes, reservoirs, and other water impoundments, ground surfaces, roadways, or other property.

b. Seeding & Mulching:

Seeding and mulching shall be carried out immediately behind construction in accordance with the following specifications:

SEEDING SPECIFICATIONS			
SHOULDERS, SIDE DITCHES, SLOPES (MAX. 3:1)			
SEEDING PERIOD	TYPE	APPLICATION RATE	
		Per Acre	Per 1000 SF
Aug 15 - Nov 1	Tall Fescue	300#	7#
Nov 1 - Mar 1	Tall Fescue <u>and</u>	300#	7#
	Abruzzi Rye	25#	0.6#
Mar 1 - Apr 15	Tall Fescue	300#	7#
Apr 15 - Jun 30	Hulled Common Bermudagrass	25#	0.6#
Jul 1 - Aug 15	Tall Fescue <u>and</u>	120#	2.8#
	*Browntop Millet	35#	0.8#
	* <u>or</u> Sorghum-Sudan Hybrids	30#	0.7#

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SEEDING SPECIFICATIONS			
SLOPES (3:1 TO 2:1)			
SEEDING PERIOD	TYPE	APPLICATION RATE	
		Per Acre	Per 1000 SF
Mar 1 - Jun 1	Sericea Lespedeza (scarified)	50#	1.2#
	<u>and</u>		
(Mar 1- Apr 15)	<u>ADD</u> Tall Fescue	120#	2.8#
(Mar 1- Jun 30)	<u>OR ADD</u> Weeping Love grass	10#	0.2#
(Mar 1- Jun 30)	<u>OR ADD</u> Hulled Common Bermudagrass	25#	0.6#
Jun 1 - Sep 1	*Tall Fescue <u>and</u>	120#	2.8#
	*Browntop Millet	35#	0.8#
	* <u>or</u> Sorghum-Sudan Hybrids	30#	0.7#
Sep 1 - Mar 1	Sericea Lespedeza (unhulled, unscarified)	70#	1.6#
	<u>and</u> Tall Fescue	120#	2.8#
(Nov 1-Mar 1)	<u>ADD</u> Abruzzi Rye	25#	0.6#

*Temporary - Reseed according to optimum season for desired permanent vegetation. Do not allow temporary cover to grow over 12" in height before mowing, otherwise fescue may be shaded out.

Consult Wake Soil & Water Conservation District or North Carolina Division of Soil & Water Conservation for additional information concerning other alternatives for vegetation of denuded areas. The above vegetation rates are those that do well under local conditions; other seeding rate combinations are possible.

SEEDBED PREPARATION

- (1) Chisel compacted areas and spread topsoil three (3) inches deep over adverse soil conditions, if available.
- (2) Rip the entire area to 6-inch depth.
- (3) Remove all loose rock, roots, and other obstructions leaving surface reasonably smooth and uniform.
- (4) Apply agricultural lime, fertilizer, and superphosphate uniformly and mix with soil (see below*).
- (5) Continue tillage until a well-pulverized, firm, reasonably uniform seedbed is prepared 4 to 6 inches deep.
- (6) Seed on a freshly prepared seedbed and cover seed lightly with seeding equipment or cultipack after seeding.
- (7) Mulch immediately after seeding and anchor mulch.

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- (8) Inspect all seeded areas and make necessary repairs or reseedings within the planting season, if possible. If stand should be over 60% damaged, re-establish following original lime, fertilizer and seeding rates.
- (9) Consult Wake Soil & Water Conservation District on maintenance treatment and fertilization after permanent cover is established.

*Apply: Agricultural Limestone	- 2 tons/acre (3 tons/acres in clay soils)
Fertilizer	- 1,000 lb/acre - 10-10-10
Superphosphate	- 500 lb/acre - 20% analysis
Mulch	- 2 tons/acre - small grain straw
Anchor	- Asphalt Emulsion @ 300 gals/acre

c. Construction Entrances:

Gravel construction entrance pads shall be constructed at each point of construction access to each property. The gravel pads shall be maintained in such a manner as to prevent the deposition of mud and debris onto existing public roadways adjacent to the site.

Gravel pads shall be constructed in accordance with the latest adopted Wake County's Erosion and Sedimentation Control Ordinance and published standard detail Temporary Construction Entrance/Exit.

Special Note: It shall be the developer's responsibility to see that the construction entrance pads are properly maintained so that mud is not tracked onto adjacent streets. In the event that the gravel construction entrances are not properly maintained, or are otherwise ineffective, **the Town Representative may issue a Stop Work Order** or any other equitable remedy provided by the Town of Knightdale UDO or NC General Statutes. The Stop Work Order, which shall remain in effect until such time as the pads are restored and replenished and until any resulting mud and debris, has been removed from the adjacent streets by the Contractor.

d. Clearing Limits:

All clearing limits shall be clearly identified and staked prior to any construction. The Town shall be given 24-hour notice prior to beginning clearing operations.

2.05 Earthwork

a. General:

Earthwork shall be defined as the removal of soil (including rock) from its natural location and the depositing of such material into the proper fill areas as indicated on the plan.

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b. Rock Excavation - by Blasting:

- (1) Permit - Where rock must be removed by blasting, a written permit must first be obtained from the Town of Knightdale Public Safety Department a minimum of 24 hours before any explosive materials or blasting agents are used within the corporate limits of the Town of Knightdale and its extra-territorial jurisdiction (ETJ). A certificate of insurance, as outlined in paragraph 2.03, must be submitted to the Town prior to any blasting operations regardless of the location of the blasting.
- (2) Hours of Blasting - Blasting for rock removal shall be conducted only Monday through Friday during normal business hours.
- (3) Blasting Procedures - Blasting for trench rock may be initiated only after the permitting requirements prescribed in (1) above of this Section have been complied with. The Contractor is also reminded of the work hour limitations for blasting, as also established in (2) above of this Section.

Blasting Procedures shall conform to all applicable local, state, and Federal laws and ordinances. The Contractor shall take all necessary precautions to protect life and property, including the use of an approved blasting mat where there exists the danger of throwing rock or overburden. The Contractor shall keep explosive materials which are needed on the job site in specially constructed boxes provided with locks. These boxes shall be painted red and plainly identified as to their contents. After working hours, the boxes containing explosive material shall be removed from the job site.

Failure to comply with this specification shall be grounds for suspension of blasting operations until full compliance is made. No blasting shall be allowed unless a galvanometer is employed to check cap circuits. Where blasting takes place within 500 feet of a utility, structure, or property which could be damaged by vibration, concussion, or falling rock, the Contractor shall be required to keep a blasting log containing the following information for each and every shot:

1. Date of shot
2. Time of shot
3. Foreman's name
4. Number and depth of holes
5. Approximate depth of overburden
6. Amount and type of explosive used in each hole
7. Type of caps used (instant or delay)
8. The weather

This blasting log shall be made available to the Town Representative upon request and shall be kept in an orderly manner. Compliance by the Contractor with these specifications does in no way relieve him of legal liabilities relative to blasting operations.

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The Town Representative reserves the right to require removal of rock by means other than blasting where any utility, residence, structure, etc. is either too close to, or so situated with respect to the blasting hazardous.

c. Removal of Unstable Material:

Where unstable, organic material ("muck") is encountered in trenches or in roadways, the material shall be completely removed and replaced with suitable, thoroughly compacted material.

d. Placement of Fill:

Fill material for roadway embankments shall be free from stones greater than four (4) inches in size, construction material debris, frozen material, organic matter or other unstable material. Fill material placed in roadway embankments shall be placed in uncompacted lifts of eight (8) inches or less and compacted to a density of not less than 95% of maximum dry density as measured by AASHTO Method T-99. The compaction requirement shall be increased to 100% in the uppermost 12 inches of subgrade. These compaction requirements shall apply for that portion of the roadway measured from the back of curb and extending on a slope of 1 to 1 to the no cut/no fill line. Outside these limits soil may be compacted to a density of not less than 90% of maximum dry density as measured by AASHTO T-99.

In cut sections, the uppermost 12 inches of subgrade shall be scarified and recompactd to not less than 100 percent of maximum dry density as measured by AASHTO Method T-99.

Attention is called to Section 3 for the inspection and testing requirements.

e. Compaction Tests:

During roadway construction, the Town Representative shall require the developer or Contractor to provide compaction tests to demonstrate compliance with the compaction requirements outlined herein. Such tests may be required at any time that the Town Representative believes the compaction to be less than the required density.

All compaction testing shall be performed by a certified testing laboratory. The cost of such testing shall be borne by the developer.

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2.06 Safety

The Contractor shall provide for and maintain safety measures necessary for the protection of all persons on the work, to include; and shall fully complying with all laws, regulations and building code requirements to prevent accident or injury to persons on or about the location of the work, including all applicable provisions of OSHA regulations. The Contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations and barricade all walks, roads, and areas to keep the public away from the construction. All trenches, excavations, or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

The Contractor shall be responsible for the entire site and the necessary protection as required by the Town and by laws or ordinances governing such conditions. He shall be responsible for any damage to Town property, or that of others, by the Contractor, his employees, subcontractors or their employees and shall correct and/or repair such damages to the satisfaction of the Town of Knightdale and/or other affected parties. He shall be responsible for and pay for any such claims against the Town.

2.07 Maintenance of Traffic

Existing public streets or highways shall be kept open to traffic at all times by the Contractor unless permission to close the streets, or portions thereof, is granted by the Town Representative. When allowed to close any street, the Contractor shall contact the Town of Knightdale Public Safety Department a minimum of 24 hours before fully or partially closing any street. Proper and sufficient barricades, lights, signing and other protective devices shall be installed by the Contractor when deemed necessary by the Public Safety Department or the Town Representative. All traffic control measures shall comply with the MUTCD standards and guidelines for Work Zone Traffic Control. Failure to comply will result in issuance of a Stop Work Order.

2.08 Concrete

Concrete shall be only plant-mixed or transit-mixed concrete conforming to ASTM C33 for aggregates and to ASTM C94 for ready-mixed concrete. Any concrete poured that has a slump over four (4) inches as per ASTM C143, or has a batched time of more than 90 minutes, will be considered unacceptable and shall not be incorporated into the work. Concrete shall not be deposited on frozen subgrade. Concrete shall not be poured when the air temperature is falling and below 40° F and the predicted low temperature for the succeeding 24-hour period is less than 32° F. All concrete when placed in the forms shall have a temperature of between 50° and 90° F and shall be maintained at a temperature of not less than 50° F for at least 72 hours for normal concrete and 24 hours for high-early strength concrete or for as much time as is necessary to secure proper rate of curing and designed compressive strength.

Concrete shall be air entrained at five (5) percent, \pm one (1) percent. Retarders and accelerators shall be used only upon approval of the Town Representative.

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2.09 Installation of Utilities Not Furnished by the Town

The Developer shall arrange for the installation of all utilities that are not furnished by the Town or the City of Raleigh. This shall include electric service, telephone service, and, where available, cable television and natural gas. Restoration of Town right-of-way disturbed by installation of these types of utilities shall be the responsibility of the Developer. All utility installations shall be designed and installed in a manner to prevent the open cutting of public paved areas.

2.10 Materials

All materials incorporated in work to be accepted by the Town of Knightdale for operation and maintenance shall be new, first quality material installed in accordance with the manufacturer's instructions or these Specifications, whichever, in the opinion of the Town Representative, is more stringent or applicable.

It is the intent of this Specification to provide materials and construction methods of high standard and quality and to provide materials free from defects in workmanship and product. Substitute materials not specified may be used provided documentation (shop drawings) and samples are furnished to the Town not less than fourteen days before their scheduled delivery to the construction site. A sufficient number of copies shall be submitted such that the Town may retain three copies. The Town will issue written approval, or disapproval, of the alternate materials. The Town shall assume no responsibility for disapproving the substitute material. Current Specifications and/or the latest revisions shall apply in all cases where materials are described by these Specifications.